

King County Early Defibrillation Procedures

King County Emergency Medical Services King County, Washington Revised May 2003

Table Of Contents

<u>Section No.</u>	<u>Title and Contents</u>
1.0	Purpose
2.0	Goals and Objectives
3.0	Authorization and Certification 3.1 Authorization and Standing Orders 3.2 Certification
4.0	Training Requirements 4.1 Initial AED Training Requirements 4.2 Initial Manual Defibrillator Training Requirements 4.3 Initial ECG Monitor Training Requirements 4.4 Instructor Requirements and Authorization 4.5 Competency Based Requirements – AED Users 4.6 Competency Based Requirements – Manual Defibrillator 4.7 Competency Based Requirements – ECG Monitoring
5.0	Field Event Documentation and Reporting 5.1 Approved Defibrillators 5.2 Quality Improvement
6.0	Equipment and Maintenance 6.1 Minimum Defibrillator Design and Operation Requirements 6.2 Manual Defibrillators 6.3 Maintenance, Testing, and Record Keeping
7.0	Standing Orders

King County Early Defibrillation Procedures

King County Emergency Medical Services
King County, Washington

1.0 Purpose

The purpose of this document is to outline the components of the King County Early Defibrillation Procedures. These are the minimum requirements for King County Fire and EMS Agencies providing early defibrillation services and electrocardiogram (ECG) monitoring services as Basic Life Support (BLS) first responders dispatched from 911 within the King County Emergency Medical Services System.

2.0 Goals and Objectives

The overall goal of the King County EMS Early Defibrillation Procedures is to resuscitate the greatest number of persons from cardiac arrest. The Program reaches this goal by meeting the following Program objectives:

- Provide centralized medical direction and program resources
- Provide clear, concise standing orders while allowing the EMT /FR to utilize sound medical judgment when appropriate
- Conduct consistent, effective, and scenario-based initial defibrillation training
- Provide Instructors with current information and effective training tools with annual refresher training
- Maintain adequate skill levels through consistent, periodic continuing education
- Ensure Program quality improvement through field event quality assurance and continuous program improvement
- Promote the consistent use of well maintained defibrillation equipment

3.0 Authorization and Certification

3.1 Defibrillation by first responders and EMTs is taught as a fundamental skill in basic EMT and first responder classes and CBT curriculums. Proficiency is documented before both initial and renewal of EMT certification.

4.0 Training Requirements

4.1 Initial **AED** Training Requirements-- Defibrillation is taught as part of the basic EMT curriculum requirements required by the State of Washington. This training covers the use of semiautomatic external cardiac defibrillators (AEDs) during resuscitation from cardiac arrest. Those EMTs who use manual defibrillators have additional training requirements.

4.2 Initial **Manual** Defibrillator Training Requirements—For those EMTs who use manual defibrillators, which require visual recognition of shockable rhythms and manual induction of defibrillation, additional training and retraining are required. This training should also include rhythm recording and recognition.

4.3 Initial **ECG Monitoring** Training Requirements

For those departments who wish to use AEDs to conduct ECG monitoring an additional training period is necessary. This period should emphasize the selection of patients suitable for monitoring; the application of the AED as a monitor; the recording and basic recognition of important cardiac arrhythmias and the description of these arrhythmias to ALS personnel.

4.4 Instructor Requirements and Authorization

The Defibrillation Coordinator from the KCEMS Division Training Section shall determine eligibility of the instructors for initial training courses. Instructors for all King County EMS defibrillation courses must have completed a Defibrillation Instructor Workshop provided by King County Emergency Medical Services. **Requirements for Defibrillation Instructor eligibility include:**

- At least two years as a certified EMT
 - Attend a King County Defibrillation Instructor Workshop at least every 2 years
 - Current AHA Instructor
- OR**
- Current University of Washington certified Paramedic, Paramedic certified to work in King County or ACLS trained provider
 - Attend a King County Defibrillation Instructor Workshop at least every 2 years.
 - Maintain familiarization with AEDs used in King County.

4.5 Competency Based Requirements—AED Users

Continued competency depends upon successful demonstration of the following requirements:

- The EMT must complete a resuscitation skills assessment at least twice during each year. In addition, they will demonstrate a proficient response to at least two scenarios using the application of AED (Twice during each assessment period, for a total of 4 times in a calendar year). These scenarios should include “SHOCK” “NO SHOCK” and troubleshooting requirements.
- Resuscitation scenarios must be performed on a manikin using CPR, Airway Management, and Defibrillation skills in accordance with currently approved Standing Orders. Review of resuscitation by use of on line instruction is useful but may not be used as a substitute.
- CPR/obstructed airway procedures should be reviewed and a skill’s checklist meeting AHA standards for adult, child and infant completed at least once each calendar year.

- A field cardiac arrest event in which the EMT manages the resuscitation and operates the defibrillator may count as ½ of this annual competency requirement.
- Fire and EMS Agencies may impose additional requirements if desired.
- Departments are encouraged to include the resuscitation/defibrillation assessment in the skills evaluation done as part of CBT.

4.6 Competency Based Requirements—**Manual** Defibrillator Users
Continued competency depends upon successful maintenance of the following requirements:

- The EMT must complete a resuscitation skills assessment at least four times during each year. Each evaluation will consist of a response to at least two scenarios that must include the application of a manual defibrillator.
- Eight resuscitation scenarios must be performed on a manikin using CPR, Airway Management, and Defibrillation skills in accordance with currently approved Standing Orders. Review of resuscitation by use of on line instruction is useful but may not be used as a substitute.
- CPR/obstructed airway procedures should be reviewed and a skill's checklist meeting AHA standards for adult, child and infant completed at least once each calendar year.
- Fire and EMS Agencies may impose additional requirements if desired.
- A field cardiac arrest event in which the EMT-manages the resuscitation and operates the defibrillator may count as 1/4 of this annual requirement (1 session, 2 scenarios – 1 field event equals 4 resuscitation scenarios).
- Departments are encouraged to include the resuscitation/defibrillation assessment in the skills evaluation done as part of CBT.

4.7 Competency Based Requirements –ECG Monitoring
For those who perform this skill, ECG Monitoring should be included in a scenario based skills demonstration at least once a year during a CBT resuscitation skills evaluation.

5.0 Field Event Documentation and Reporting

5.1 The following documentation and recording requirements apply to **all cardiac arrest patients** with a BLS response.

All available documentation (from all EMS agencies involved in the incident) should be sent to the EMS Division within four days of the event. An event is defined as any incident where an EMT performed CPR, whether or not a defibrillator was applied. This includes traumatic CPR, pediatric cases, and cases where no-code status was discovered after CPR was initiated.

- 5.1.1 Every defibrillator attachment to a patient in cardiac arrest must have a recording by the defibrillator and a MIRF completed.
- 5.1.2 An email notification message should be generated, immediately following the event and sent to terry.sinclair@metrokc.gov if possible.
- 5.1.3 There are rare exceptions when BLS providers are present at a cardiac arrest and do not use the defibrillator.
- Serious trauma, primarily when the cardiac arrest is believed to be due to major exsanguinating hemorrhage
 - Patients with a valid Washington State EMS No CPR bracelet or form or other approved documentation
 - Patients who experience cardiac arrest after the arrival of Medics
 - Patients for whom Medics arrive before the BLS crew can apply the defibrillator.
- 5.1.4 Even if a defibrillator is not applied, the MIRF should be mailed.
- 5.1.5 When a defibrillator recording cannot be provided a brief explanation must be included in the MIRF narrative. Examples include: mechanical failure, recorder not turned on, accidental loss, or one of the exceptions listed above.

What documentation to send:

- 1) MIRF data (from ALL involved EMS agencies)
- 2) Defibrillator data (when defibrillator was applied)

	Method of Collection	
	Non-electronic	Electronic
Medical Incident Report Form (MIRF)	Send copies of the long form*	Copies of the short form <u>and</u> computer printout of the incident report*
Defibrillator data (when defibrillator was applied)	Send cassette, card or disk and/or paper tape*	Electronic file**

* Use the self-addressed stamped envelopes provided by the EMS Division

** To post a defibrillator event has taken place e-mail address: terry.sinclair@metrokc.gov
(All cases should be sent through the secure server to their departments defib folder).

Contact Information: For all questions and comments.

Cardiac Arrest Database	Defibrillation program coordinators
Linda Becker, CASS Coordinator King County EMS Division 999 Third Ave, Suite 700 Seattle, WA 98104 (206) 296-0206 Email: Linda.Becker@metrokc.gov	Don Cloyd, Defibrillation program Coordinator King County EMS Division 999 Third Ave, Suite 700 Seattle, WA 98104 (206) 786-1611 Email: don.cloyd@metrokc.gov Terry Sinclair Defibrillation QA Coordinator (206) 296-4382 Email: terry.Sinclair@metrokc.gov or FireMednet.

5.2 Quality Improvement

Recordings of field resuscitation events shall be reviewed as directed by the each case will be reviewed by the Quality Improvement Coordinator. A Quality Improvement and Performance Report will be completed for each case reviewed. The results of this analysis will be returned promptly to the agency of origin. Items included in this report and other performance indicators may be collected and used to identify areas for quality improvement.

6.0 Equipment and Maintenance

6.1 Minimum Defibrillator Design and Operation Requirements

The following is a listing of the minimum design and operation requirements for automated, FDA approved external AED defibrillators used by 911 first responders /EMTs in King County:

- The ability to automatically analyze and detect Ventricular Fibrillation and Fast, Ventricular Tachycardia
- Hands free defibrillation using self adhesive defibrillation pads
- On screen ECG display
- Verbal and on screen prompts and error messages
- Manual operation or override capability
- Cassette tape or similar event recorder approved by King County EMS for recording voice, time, and ECG data.
- Analysis and Shock sequences which are or can be programmed to be consistent with King County Defibrillation Standing Orders
- Recording method for information required by KCEMS Field Event Documentation.
- AEDs used in ECG monitoring must provide a paper recording of ECG rhythms.
- Successful transfer to EMS of required data from a test case.

6.2 Manual Defibrillators

These devices must be FDA approved and meet the requirements of 6.1

6.3 Maintenance, Testing, and Record Keeping

All semi-automated and manual defibrillators used by Fire and EMS Agencies shall be maintained in a fully operational condition in accordance with the recommendations of the manufacturer. Although defibrillator malfunctions are uncommon, frequent operational checks are necessary to ensure proper functioning. Batteries are the most common source of failure when the defibrillator fails to deliver a shock. Agencies should follow manufacturer's recommendations regarding battery conditioning and charging schedules.

Agencies shall also perform an operational inspection and function test of each defibrillator. In addition to a visual inspection, a functional test-using manufacturer recommended equipment must be performed (e.g. simulate VF, ensure a shock is advised and deliver a detectable shock to the simulator/tester). Records of inspections and functional tests must be maintained by the Agency.

Revisions and Comments

Please address all comments and requests for revisions to:

Don Cloyd
Defibrillation Program Coordinator
Or The Medical Program Director
King County Emergency Medical Services
999 3rd Avenue, Suite 700
Seattle, WA 98104

Standing Orders for Cardiac Defibrillation by Emergency Medical Technicians

Mickey Eisenberg, MD, King County Medical Program Director

SCOPE:

Effective January 1, 2003, these orders replace all previous standing orders. These Standing Orders direct the use of both automated and manual external defibrillators operated by currently certified and authorized King County EMS Defibrillation Providers.

PURPOSE:

The purpose of these orders is to direct the prompt defibrillation of patients who have confirmed circulatory arrest due to ventricular fibrillation.

AUTHORIZATION:

In the event of a full cardiac arrest in King County, Washington, the defibrillation technician is authorized to perform the following:

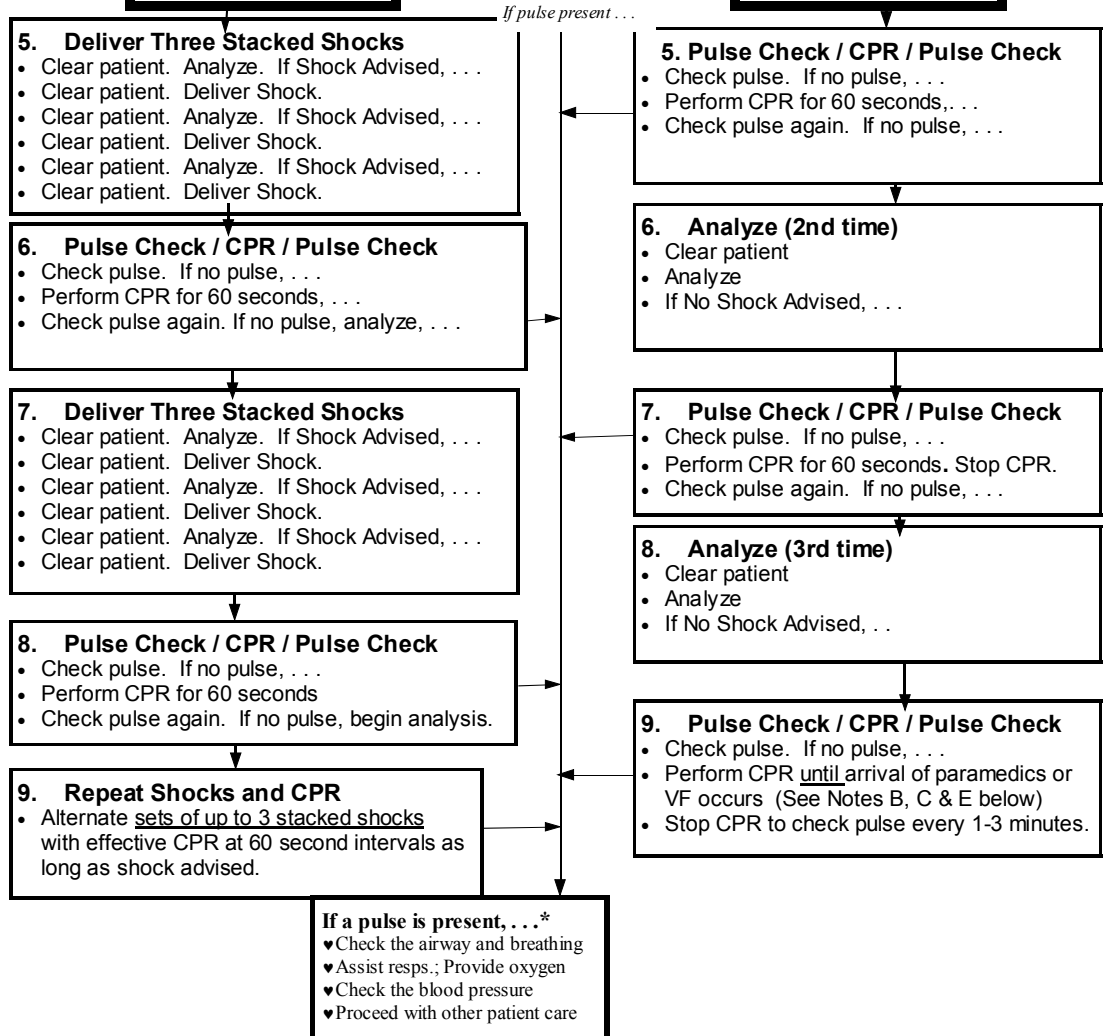
- I. Immediately upon arrival, verify respiratory and circulatory arrest by the absence of: consciousness, normal respirations and a carotid pulse.
- II. Initiate CPR and defibrillation protocols.
- III. **GENERAL DEFIBRILLATION PROTOCOL:** King County EMS Defibrillation Providers are authorized to deliver electric shocks with a defibrillator to patients whose ECG rhythm is Ventricular Fibrillation. This should be done as quickly as possible, with a minimum interruption of CPR. Exact sequencing details may vary as long as the following overall goals are realized:
 - A. VF is *shocked repeatedly* and as *rapidly* as possible.
 - B. *Effective CPR* is performed and *interrupted for a minimum time*.
 - C. *Overall patient care and safety* are never neglected.
- IV. **ASSESSMENT:** Assess/Analyze the ECG rhythm for the presence of Ventricular Fibrillation (VF):
 - A. Turn the defibrillator power on and begin a verbal report.
 - B. Immediately attach the defib pads with cables to the patient's chest.
 - C. Clear patient to Analyze/Assess the patient's rhythm.

V. TREATMENT ALGORITHM FOR AUTOMATED EXTERNAL

1. Assess ABCs. If not breathing, open airway & begin ventilations. If no pulse, . . .
2. Perform effective CPR until AED is attached. Begin verbal report.
3. Clear the patient.
4. Activate the analyze mode or allow auto-analysis to begin:

SHOCK ADVISED (VF/VT)

NO SHOCK ADVISED (NOT VF/VT)

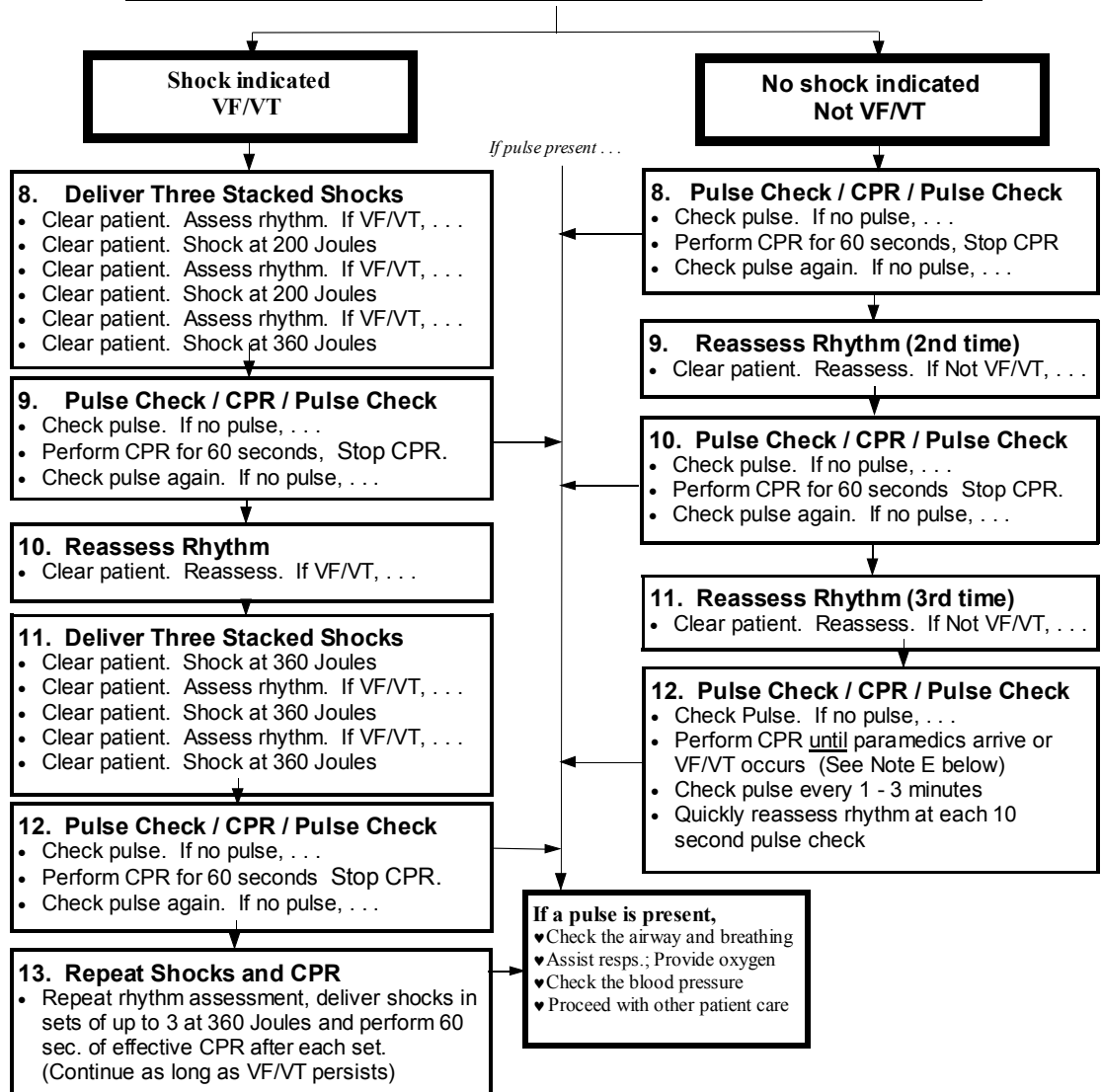


Notes:

- A. If Shock Advised at any time, return to the Shock Advised branch of the algorithm.
- B. If Shock Advised anytime, continue analyzing pulseless patient after every few minutes of CPR even after 3 "No Shock Advised".
- C. If never in VF and three consecutive "No Shock Advised" prompts received, continue effective CPR until paramedics arrive.
- D. From the beginning of the resuscitation, the defib-tech must take charge of the scene and patient care.
- E. The "Check Patient" prompt indicates the patient may now be in a shockable rhythm. If the last analysis was a No Shock Advised, the defib tech may assume there is a change in the patient's rhythm, stop CPR, check pulse, clear patient and begin analysis.
- F. Time and equipment permitting, record a paper strip when "No Shock Advised" prompt is received

VI. TREATMENT ALGORITHM FOR MANUAL EXTERNAL DEFIBRILLATION

1. Assess ABCs. If not breathing, open airway & begin ventilations. If no pulse, . . .
2. Perform effective CPR until a defibrillator is attached. Begin verbal report.
3. Attach pads and cables.
4. Clear patient
5. Begin charging at 200 Joules
6. Assess ECG rhythm for **VF/VT** (Goal = No more than 10 seconds)



Notes:

- A.If VF/VT recurs at any time or is detected in any other lead, return to the VF/VT branch of the algorithm and treat with shocks..
- B.From the beginning of the resuscitation, the defib tech must take charge of the scene and patient care.
- C.If rhythm assessment indicates the possibility of VTach, then continue CPR while considering switching to the AED mode for analysis.
- D.If never in VF/VT and three consecutive "Not VF" assessments are performed, continue CPR until paramedics arrive.
- E.Time and equipment permitting, record a paper strip of the ECG rhythm during assessment.

VII. APPENDIX

A. Clinical Guidelines

1. **Non-Cardiac Arrest Patient:** For those departments who wish to use AED's to conduct ECG monitoring an additional training period is necessary. This period should emphasize the selection of patients suitable for monitoring; the application of the AED as a cardiac monitor; the recording and basic recognition of important cardiac arrhythmias and the description of these arrhythmias to ALS personnel.
2. **Carotid Pulse Check:** In an unconscious, unresponsive patient, the carotid pulse will always be used to confirm cardiac arrest. Pulse checks should not exceed 10 seconds. (absence of a femoral pulse does not confirm cardiac arrest).
3. **Communication:** Verbal communication on the tape or card is to be ongoing throughout the event. Describe your actions as you do them and resuscitation events as they occur. Allow the cassette tape or card to record until Paramedics arrive and specifically direct the defib tech to stop the recording, or until the patient is transported and care is assumed by hospital staff.
4. **No Prescribed Period Of Initial CPR:** Upon arrival at the scene and verification of cardiac arrest, the defibrillation EMT/First Responder shall proceed immediately with the defibrillation protocols outlined in these standing orders (after properly positioning the patient and arranging the working environment, if necessary).
5. **No Excessive Interruptions of CPR:** If delays in CPR of 10 seconds or more are encountered (e. g. vomiting, safety issue, etc.), resume CPR as soon as possible until the problem is resolved. Once the issue is resolved, reassess the patient and continue with the defib standing orders. Delays in CPR of more than 10 seconds are permitted only during rhythm assessment/analysis and shock delivery. In particular, do not delay CPR while checking to see if a rhythm is producing a pulse. IF NO PULSE IS FOUND IN 10 SECONDS (UNCONSCIOUS PATIENT), RESUME CPR IMMEDIATELY.
6. **Blood Pressure Less Than 60 mm Hg:** If the patient's systolic blood pressure (after resuscitation) is less than 60 mm Hg, and the patient remains unconscious, continue CPR. Do not stop chest compressions just because the heart has started to beat. The heart beat may be inadequate to perfuse the patient but still may provide a pulse.
7. **Rapid Defibrillation:** The first shock should be delivered within 60 seconds of the provider's arrival at the patient's side (timed from pulse check). This time is typically started when the patient is determined to be pulseless (i.e. when the defib tech is authorized to power the defibrillator and apply to the patient). For the defib tech, defibrillation is the highest priority in a cardiac arrest. It takes precedence over basic CPR, ventilations, suctioning, history taking, verbal updates or to troubleshoot problems with the tape cassette or ECG paper. For the CPR technician, maintaining the airway, providing effective ventilations and performing effective CPR are the highest priorities.
8. **Documentation Submittal:** Tape recordings are required for all cardiac arrest patients in which CPR is started. We suggest that the reporting EMT make the initial notification of the cardiac arrest event immediately by email to terry.sinclair@metrokc.gov. The case is to be sent via secured server to the defib folder for your department or put on a disk and mailed in. The cassette tape or electronic transmission and Medical Incident Report form (short report and printout of the down load from the computer) must be submitted to King County EMS within 4 days of the cardiac arrest event. Tape recordings and, if applicable, paper strip recordings, are also required for all cardiac arrests.

B. Special Patient and Pediatric Guidelines

1. **Pediatric Arrest:** For children less than 8 years of age, verify cardiac arrest and begin effective CPR. Do not analyze or shock a cardiac arrest patient who is less than 8 years of age. For children over 8 years of age, follow adult defibrillation protocols.
2. **Traumatic Arrest:** Defibrillation is ineffective in the true traumatic cardiac arrest. If major blood loss/major trauma is obvious, initiate basic life support. Rhythm assessment and defibrillation have low priority in cardiac arrest due to trauma. If major blood loss/major trauma is **not** obvious, approach the patient as usual and initiate defibrillation protocols.
3. **Patients attached to a Public access defibrillator (PAD):** there may be a time when responders arrive to find the patient attached to a PAD. If the device appears to be functioning properly and the defib tech is comfortable with it's operation; it is suggested that the defib tech continue to defibrillate with the PAD until such a time that it's removal becomes necessary. (unit failure, transport, etc.)

C. Safety In Defibrillation

1. Everyone, including the defib tech, must be clear of the patient when delivering the shock. The defib tech **must visually and verbally clear the patient prior to the shock.** Clearing of the patient is also required prior to rhythm analysis/assessment.
2. Ensure defib pads/paddles are in firm contact with the patient's skin. If necessary, shave excessive hair. If the patient is wet/sweaty, dry the chest before applying pads or defibrillating.
3. Remove any creams, patches and/or ointments from the chest (e.g. nitro patch, paste). Do not take the time to identify which type of cream/ointment/patch is on the patient.
Use BSI precautions
4. Some Agencies may transport patients. If it is necessary to deliver a shock while transporting a patient, the defib tech shall proceed in the following manner:
 - a) Bring the vehicle to a complete stop. Assure there is no motion affecting rhythm analysis/assessment.
 - b) Assure the safety of all personnel. *Defibrillation hazards increase* in an area of limited space or when metal objects (e.g. stretcher) are close by.
5. Motion detectors on LP 300 defibrillators used within King County have been modified to provide an advisory only prompt. When motion is detected by the LP300, the defib tech shall immediately check the patient, environment, and the patient cable for motion. He/she will immediately eliminate motion when possible. Verbalize the findings of the motion. Proceed with the standing orders at the completion of the motion check.

D. Defibrillators Approved for King County EMS Defib Provider Agencies

[Call King County EMS for specific design and equipment requirements, and recommendations at 206-296-4382]

Heartstart 3000	FR	FR-2	ZOLL M-SERIES
LifePak 300	LifePak 12	MRL-advanced	